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EXAMINER

NANO, SARGON N

ART UNIT PAPER NUMBER

2157

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/927,894

Applicant(s)

JEWETT ET AL.

Examiner

Sargon N. Nano

Art Unit

2157

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 59 is/are pending in the application.
4a) Of the above claim(s) 38 - 53 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1 - 37, 54 - 59 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment

1. This office action is responsive to election/restriction received on August 29, 2005. Applicant elected group I for prosecution which consists of claims 1 – 37 and 54 – 59 without traverse.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 57 and 59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 57 and 59 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

MPEP 2106 IV.B.2.(b)

A claim that requires one or more acts to be performed defines a process. However, not all processes are statutory under 35 U.S.C. 101. Schrader, 22 F.3d at 296, 30 USPQ2d at 1460. To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan, or (B) be limited to a practical application within the technological arts.

Claims 57 and 59, in view of the above cited MPEP sections, are not statutory because they merely recite a computer program represented in computer storage without producing any tangible result and/or being limited to a practical application within the technological arts.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 – 37 and 54 – 59 are rejected under 35 U.S.C. 102(e) as being anticipated by brown et al. U.S. Patent No. 6,912,668. Brown teaches Methods and systems for implementing shared disk array management functions are connected to multiple redundancy groups over storage area (see abstract).

As to claim 1, Brown teaches a block-level shared network storage system, comprising:

a storage server comprising an array of disk drives, and comprising a processor that runs a device driver to provide block-level access to data stored on the array of disk drives (see col.2 lines 1 – 25 , Brown discloses multiple disk arrays for data storing);
and

a host computer coupled to the storage server by at least one computer network; wherein the host computer and the storage server perform input/output (I/O) operations over the at least one network using multiple, concurrent logical connections, each logical connection being between the host computer and the storage server over the at least one computer network such that a first I/O operation is executed over a first logical connection while a second I/O operation is executed over a second logical connection (see col. 2 lines 1 – 42, Brown discloses concurrent access to the redundancy groups of disk arrays).

As to claim 2, Brown teaches the network storage system as in Claim 1, wherein each logical connection is a socket connection (see col. 6 lines 31 – 43).

As to claim 3, Brown teaches the network storage system as in Claim 2, wherein each socket connection is a TCP/IP socket connection (see col. 6 lines 31 – 43).

As to claim 4, Brown teaches the network storage system as in Claim 1, wherein each logical connection remains persistent over multiple I/O operations performed over that logical connection (see col. 3 lines 1 – 39).

As to claim 5, Brown teaches the network storage system as in Claim 1, wherein the host computer is programmed to divide an I/O operation into multiple constituent I/O operations, and to perform the multiple constituent I/O operations in parallel over respective logical connections of said multiple, concurrent logical connections (see col. 3 lines 1 – 39).

As to claim 6, Brown teaches the network storage system as in Claim 1, wherein the storage server provides virtualized block-level storage access to the host computer such that the storage server is treated as local disk drive storage by user-level processes running on the host computer (see fig. 8 Brown discloses a plurality of virtual disks).

As to claim 7, Brown teaches the network storage system as in Claim 1, wherein the storage server is configurable to provide multiple storage partitions, each of which may be allocated to a different host computer (see fig. 8 Brown discloses a plurality of virtual disks connected to multiple computes).

As to claim 8, Brown teaches the network storage system as in Claim 1, wherein the storage server has a first storage partition which is uniquely assigned to the host computer such that the first storage partition appears to user-level processes running on the host computer as a private, local disk drive (see col. 8 line 44 – col. 9 line 11).

As to claim 9, Brown teaches the network storage system as in Claim 8, wherein the storage server further has a second storage partition which is uniquely assigned to a second host computer (see fig. 8).

As to claim 10, Brown teaches the network storage system as in Claim 8, wherein the storage server further has a second storage partition which is shared by multiple host computers (see fig. 8).

As to claim 11, Brown teaches the network storage system as in Claim 1, wherein the host computer and the storage server implement an authentication protocol in which the storage server authenticates the host computer before allowing the host

computer to perform input/output operations (see col. 4 lines 24 – 39, brown discloses requesting a lock before performing operation on a resource).

As to claim 12, Brown teaches the network storage system as in Claim 1, wherein the host computer and the storage server implement a discovery protocol in which the storage server notifies the host computer of partitions assigned to the host computer (see col. 6 lines 31 – 43).

As to claim 13, Brown teaches the network storage system as in Claim 1, wherein at least one of the logical connections is over a general-purpose computer network (see fig. 8).

As to claim 14, Brown teaches the network storage system as in Claim 1, wherein at least one of the logical connections is over an Ethernet network (see col. 6 lines 5 – 30).

As to claim 15, Brown teaches the network storage system as in Claim 1, wherein the first and second logical connections exist over separate computer networks (see fig. 6).

As to claim 16, Brown teaches the network storage system as in Claim 1, wherein each logical connection exists between a respective reader/writer pair (see col. 8 lines 4 – 29).

As to claim 17, Brown teaches the network storage system as in Claim 1, wherein the host computer and the storage server are interconnected by at least one switch (see fig. 7).

As to claim 18, Brown teaches the network storage system as in Claim 1, wherein the host computer and the storage server each include two network interfaces that provide redundant network connections between the host computer and the storage server (see col. 6 lines 31 – 43).

As to claim 19, Brown teaches a system for storing data for host computers, comprising:

a plurality of storage servers connected to a network, each storage server comprising an array of disk drives, an array controller, and a processor(see col. 9 lines 2 – 38 and fig. 8);

a plurality of host computers connected to the network and programmed to store data on the storage servers; and at least one switch which interconnects the plurality of storage servers with the plurality of host computers; wherein each host computer is programmed to open multiple concurrent sees socket connections over the network to the storage servers for performing concurrent input/output operations (see col. 9 lines 2 – 38 and figs. 2 & 8).

As to claim 20, Brown teaches the system of Claim 19, wherein the sockets socket connections are TCP/IP sockets connections (see col. 2 line 1 – 42 and figs. 2 & 8).

As to claim 21, Brown teaches the system of Claim 19, wherein each storage server of the plurality of storage; servers provides virtualized block-level storage access to the host computers such that the Week storage servers appear are treated as local

disk drive storage to by user-level processes running on the host computers (see fig. 8 Brown discloses a plurality of virtual disks).

As to claim 22, Brown teaches the system of Claim 19, wherein at least a first host computer of the plurality of host computers is programmed to divide an I/O operation into multiple constituent I/O operations, and to perform the multiple constituent I/O operations in parallel over respective logical socket connections between the first host computer and a target storage server (see col. 3 lines 1 – 39).

As to claim 23, Brown teaches the system of Claim 19, wherein a first storage server of the plurality of storage servers is configurable to provide multiple, variable-size partitions, each of which may be allocated to a different host computer of the plurality of host computers (see col. 3 lines 1 – 39).

As to claim 24, Brown teaches the system of Claim 19, wherein a first storage server of the plurality of storage servers has a first partition which is uniquely assigned to a first host computer of the plurality of host computers such that the first partition appears as a local disk drive to the first host computer (see col. 8 line 44 – col. 9 line 11).

As to claim 25, Brown teaches the system of Claim 24, wherein the first storage server further has a second partition which is uniquely assigned to a second host computer of the plurality of host computers (see fig. 8).

As to claim 26, Brown teaches the system of Claim 19, wherein the host computers and the storage servers implement: an authentication protocol in which a

storage server authenticates a host computer before allowing the host computer to perform input/output operations (see col. 4 lines 24 – 39).

As to claim 27, Brown teaches the system of Claim 19, wherein the host computers and the storage servers implement a discovery protocol in which a storage server notifies a host computer of partitions assigned to the host computer (see col. 6 lines 31 – 43).

As to claim 28, Brown teaches a method of performing input/output operations, comprising: establishing first and second TCP/IP connections between a host computer and a block-level storage server over one or more computer networks (see col. 2 lines 1 – 42);

performing a first input/output operation over the first TCP/IP connection while concurrently with performing a second input/output operation over the second TCP/IP connection, each of said input/output operations comprising a transfer of input/output data between the host computer and the storage server; and maintaining the first and second TCP/IP connections is a persistent state such that each TCP/IP connection may be used to perform additional input/output operations(see col. 2 lines 1 – 42).

As to claim 29, Brown teaches the method as in Claim 28, wherein the first and second TCP/IP connections are established over separate computer networks (see col. 6 lines 31 – 43).

As to claim 30, Brown teaches the method as in Claim 28, wherein the first input/output operation is a first I/O request issued from a first application running on the

host computer, and the second input/output operation is a second 1/O request issued from a second application running on the host computer (see col. 6 lines 31 – 43).

As to claim 31, Brown teaches the method as in Claim 28, wherein the first and second input/output operations are constituent operations of an I/O request issued by a process running on the host computer, whereby the 1/O request is executed in parallel over multiple TCP/IP connections (see col. 2 lines 1 – 42).

As to claim 32, Brown teaches the method as in Claim 28, further comprising establishing a third TCP/IP connection between the host computer and the storage server, and using the third TCP/IP connection to perform an authentication sequence in which the storage server authenticates the host computer (see col. 2 lines 1 – 42).

As to claim 33, Brown teaches the method as in Claim 32, further comprising conveying access information over the third TCP/IP connection from the storage server to the host computer, said access information specifying access rights uniquely assigned to the host computer (see col. 4 lines 24 – 39).

As to claim 34, Brown teaches a method of executing an input/output (1/O) request received from a user-level process running on a host computer, comprising:

on the host computer, dividing the 1/O request into multiple constituent I/O operations(see col. 3 lines 1 – 39); and

performing the multiple constituent T/O operations in parallel over multiple, respective logical network connections between the host computer and a target storage server such that 1/O data is transferred between the host computer and the storage server over each of the logical network connections(see col. 3 lines 1 – 39).

As to claim 35, Brown teaches the method of Claim 34, wherein each logical network connection is a socket connection (see col. 6 lines 31 – 43).

As to claim 36, Brown teaches the method of Claim 34, wherein each logical network connection is a TCP/IP socket connection (see col. 6 lines 31 – 43).

As to claim 37, Brown teaches the method of Claim 34, wherein at least one of the logical network connections is over a general-purpose computer network (see fig. 8).

As to claim 54, Brown teaches the network storage system as in claim 1, wherein the host computer and the storage server communicate with each other over each of the logical connections using a TCP/IP protocol (see col. 6 lines 31 – 43).

As to claim 55, Brown teaches the system of Claim 19, wherein a first host computer of said plurality of host computers is programmed to open first and second socket connections over the network to a first storage server of said plurality of storage servers, and to perform a first input/output operation over the first socket connection while performing a second input/output operation over the second socket connection (see col. 2 lines 1 - 42).

As to claim 56, Brown teaches the system of Claim 19, wherein the host computers and storage servers are programmed to perform said input/output operations via TCP/IP communications over said socket connections (see col. 6 lines 31 – 43).

As to claim 57, Brown teaches a computer program represented in computer storage, said computer program comprising executable instructions for performing the method of Claim 28 (see col. 3 lines 1 – 39).

As to claim 58, Brown teaches the method of Claim 34, wherein performing the multiple constituent I/O operations comprises the host computer communicating with the target storage server over the multiple logical network connections using a TCP/IP protocol (see col. 3 lines 1 – 39).

As to claim 59, Brown teaches a computer program represented in computer storage, said computer program comprising executable instructions for performing the method of Claim 34(see col. 3 lines 1 – 39).

Response to Arguments

4. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sargon N. Nano whose telephone number is (571) 272-4007. The examiner can normally be reached on 8 hour.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sargon Nano
Nov. 19, 2005


ARIO ETIENNE
PRIMARY EXAMINER